



Software Quality Engineering
LabTask 03

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Main Program

```
1 package com.mycompany.sqe_lab_03;
2
3 public class DataTypeRanges { 14 usages
4
5     public static void main(String[] args) { no usages
6         System.out.println("Byte range: " + Byte.MIN_VALUE + " to " + Byte.MAX_VALUE);
7         System.out.println("Short range: " + Short.MIN_VALUE + " to " + Short.MAX_VALUE);
8         System.out.println("Integer range: " + Integer.MIN_VALUE + " to " + Integer.MAX_VALUE);
9         System.out.println("Long range: " + Long.MIN_VALUE + " to " + Long.MAX_VALUE);
10        System.out.println("Float range: " + Float.MIN_VALUE + " to " + Float.MAX_VALUE);
11        System.out.println("Double range: " + Double.MIN_VALUE + " to " + Double.MAX_VALUE);
12        System.out.println("Character range: " + (int) Character.MIN_VALUE + " to " + (int) Character.MAX_VALUE);
13        System.out.println("Boolean values: " + Boolean.FALSE + " and " + Boolean.TRUE);
14    }
15
16    // Helper methods for testing
17    public static byte getByteMin() { return Byte.MIN_VALUE; } 1 usage
18    public static byte getByteMax() { return Byte.MAX_VALUE; } 1 usage
19    public static short getShortMin() { return Short.MIN_VALUE; } 1 usage
20    public static short getShortMax() { return Short.MAX_VALUE; } 1 usage
21    public static int getIntMin() { return Integer.MIN_VALUE; } 1 usage
22    public static int getIntMax() { return Integer.MAX_VALUE; } 1 usage
23    public static long getLongMin() { return Long.MIN_VALUE; } 1 usage
24    public static long getLongMax() { return Long.MAX_VALUE; } 1 usage
25    public static float getFloatMin() { return Float.MIN_VALUE; } 1 usage
26    public static float getFloatMax() { return Float.MAX_VALUE; } 1 usage
27    public static double getDoubleMin() { return Double.MIN_VALUE; } 1 usage
28    public static double getDoubleMax() { return Double.MAX_VALUE; } 1 usage
29    public static char getCharMin() { return Character.MIN_VALUE; } 1 usage
30    public static char getCharMax() { return Character.MAX_VALUE; } 1 usage
31 }
```

Program Output:

```
Byte range: -128 to 127
Short range: -32768 to 32767
Integer range: -2147483648 to 2147483647
Long range: -9223372036854775808 to 9223372036854775807
Float range: 1.4E-45 to 3.4028235E38
Double range: 4.9E-324 to 1.7976931348623157E308
Character range: 0 to 65535
Boolean values: false and true
```

Test Program

```
DataTypeRangesTest.java x
1 package com.mycompany.sqe_lab_03;
2
3 import org.junit.jupiter.api.Test;
4 import static org.junit.jupiter.api.Assertions.*;
5
6 public class DataTypeRangesTest {
7
8     @Test
9     void testByteRange() {
10         assertEquals(expected: -128, DataTypeRanges.getByteMin());
11         assertEquals(expected: 127, DataTypeRanges.getByteMax());
12
13     @Test
14     void testShortRange() {
15         assertEquals(expected: -32768, DataTypeRanges.getShortMin());
16         assertEquals(expected: 32767, DataTypeRanges.getShortMax());
17
18     @Test
19     void testIntRange() {
20         assertEquals(expected: -2147483648, DataTypeRanges.getIntMin());
21         assertEquals(expected: 2147483647, DataTypeRanges.getIntMax());
22
23     @Test
24     void testLongRange() {
25         assertEquals(expected: -9223372036854775808L, DataTypeRanges.getLongMin());
26         assertEquals(expected: 9223372036854775807L, DataTypeRanges.getLongMax());
27
28     @Test
29     void testFloatRange() {
30         assertEquals(Float.MIN_VALUE, DataTypeRanges.getFloatMin());
31         assertEquals(Float.MAX_VALUE, DataTypeRanges.getFloatMax());
32
33     @Test
34     void testDoubleRange() {
35         assertEquals(Double.MIN_VALUE, DataTypeRanges.getDoubleMin());
36         assertEquals(Double.MAX_VALUE, DataTypeRanges.getDoubleMax());
37
38     @Test
39     void testCharRange() {
40         assertEquals(expected: 0, DataTypeRanges.getCharMin());
41         assertEquals(expected: 65535, DataTypeRanges.getCharMax());
42     }
```

Testing Results

Run **DataTypeRangesTest** x

7 tests passed 7 tests total, 36 ms

testCharRange()	30 ms
testFloatRange()	1 ms
testByteRange()	1 ms
testLongRange()	1 ms
testShortRange()	1 ms
testIntRange()	1 ms
testDoubleRange()	1 ms

"C:\Users\Muhammad Shamoil\.jdk\openjdk-25\bin\java.exe" ...

Process finished with exit code 0